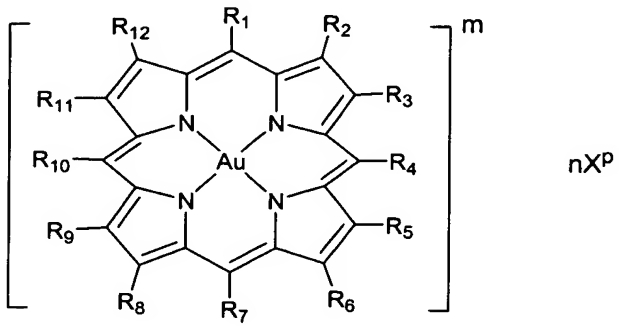
What is claimed is:

1. A method for induction of apoptosis of cancer cells comprising administering to a patient in need thereof a composition comprising an effective amount of a gold(III) complex of formula:



or a pharmaceutically acceptable salt thereof, wherein:

R_1, R_4, R_7 and R_{10} are each independently -H, -halo, -(C_1-C_6)alkyl or -O(C_1-C_6)alkyl, -(6-membered)aryl or -(5 to 10-membered)heteroaryl, each of which may be substituted with one or more -halo, -(C_1-C_6)alkyl, -O(C_1-C_6)alkyl, -OSO_2 or -NO_2;

R_2, R_3, R_5, R_6, R_8, R_9, R_{11} and R_{12} are each independently -H, -(C_1-C_6)alkyl which may be substituted with one or more -C(O)OR_{13}, -halo or =O groups;

R_{13} is -(C_1-C_6)alkyl;

each X^p is independently a pharmaceutically acceptable counter-ion;

m is an integer ranging from -3 to 5;

p is an integer ranging from -3 to 3;

n is equal to the absolute value of m/p; and

a pharmaceutically acceptable carrier.

2. The method of claim 1, wherein R_2, R_3, R_5, R_6, R_8, R_9, R_{11} and R_{12} are each -H.; X^p is Cl^-; m is 1; and n is 1.

3. The method of claim 2, wherein R_1, R_4, R_7 and R_{10} are each -phenyl.

4. The method of claim 2, wherein R_1, R_4, R_7 and R_{10} are each -4-methylphenyl.

5. The method of claim 2, wherein R_1, R_4, R_7 and R_{10} are each -4-methoxyphenyl.

6. The method of claim 2, wherein R_1, R_4, R_7 and R_{10} are each -4-bromophenyl.

7. The method of claim 2, wherein R_1, R_4, R_7 and R_{10} are each -4-chlorophenyl.

8. The method of claim 2, wherein R_1, R_4, R_7 and R_{10} are each -3,4,5-trimethoxyphenyl.

9. The method of claim 2, wherein R_1, R_4, R_7 and R_{10} are each -3,4,5-trifluorophenyl.

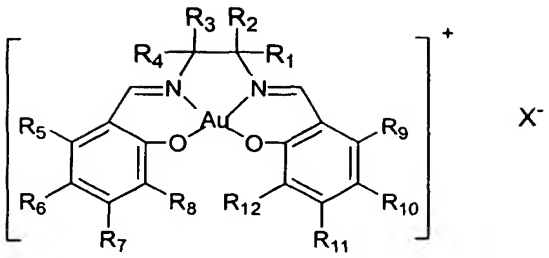
10. The method of claim 1, wherein R_1, R_4, R_7 and R_{10} are each -H; R_2, R_3, R_5, R_6, R_8, R_9, R_{11} and R_{12} are each -ethyl; X^p is Cl^-; m is 1; and n is 1.

11. The method of claim 1, wherein R_1, R_4, R_7 and R_{10} are each -H; and R_2 and R_{11} are each -ethyl; R_3, R_5, R_9 and R_{12} are each -methyl; R_6 and R_8 are each -methyl-3-propanoate; X^p is Cl^-; m is 1; and n is 1.

12. The method of claim 1, wherein R_1, R_4, R_7 and R_{10} are each -4-(N-methyl)pyridinium; R_2, R_3, R_5, R_6, R_8, R_9, R_{11} and R_{12} are each -H; X^p is Cl^-; m is 5; and n is 5.

13. The method of claim 1, wherein R_1, R_4, R_7 and R_{10} are each -4-sulfanatophenyl; R_2, R_3, R_5, R_6, R_8, R_9, R_{11} and R_{12} are each -H; X^p is Na^+; m is +3; and n is 3.

14. A method for induction of apoptosis of cancer cells comprising administering to a patient in need thereof a composition comprising an effective amount of a gold(III) complex of formula:



or a pharmaceutically acceptable salt thereof, wherein:

R_1- R_{12} are each independently -H, -halo, -(C_1-C_6)alkyl or -O(C_1-C_6)alkyl which may be substituted with one or more -O(C_1-C_6)alkyl or -halo;

X is a counter-anion; and

a pharmaceutically acceptable carrier.

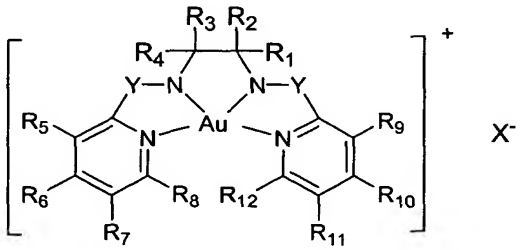
15. The method of claim 14, wherein R_1-R_4 are each -H; and X is Cl^-.

16. The method of claim 15, wherein R_5-R_{12} are each -H.

17. The method of claim 15, wherein R_5, R_7-R_9 and R_{11}-R_{12} are each -H; and R_6 and R_{10} are each -Cl.

18. The method of claim 15, wherein R_5, R_7, R_9 and R_{10} are each -H; and R_6, R_8, R_{10} and R_{12} are each -Cl.

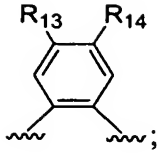
19. A method for induction of apoptosis of cancer cells comprising administering to a patient in need thereof a composition comprising an effective amount of a gold(III) complex of formula:

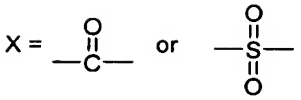


or a pharmaceutically acceptable salt thereof, wherein:

(a) R_1- R_{12} are each independently -H, -halo, -(C_1-C_6)alkyl -O(C_6)alkyl which may be substituted with one or more -O(C_1-C_6)alkyl or -halo; or

(b) R_1 and R_4 are absent; and R_2 and R_3 together form a 6-membered aryl ring of formula



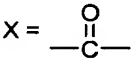
Y is  ;

R_{13} and R_{14} are each -H or -halo;

X is a counter-anion; and

a pharmaceutically acceptable carrier.

20. The method of claim 19, wherein

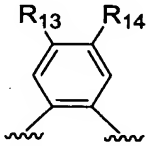
Y is  ; and

X is Cl^-.

21. The method of claim 20, wherein R_1-R_{12} are each -H.

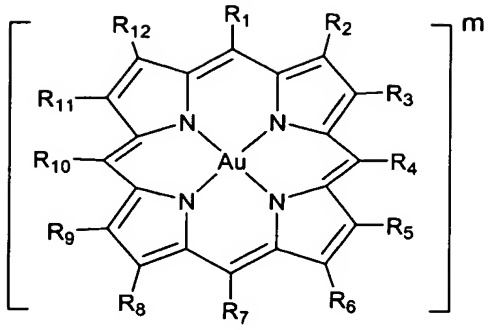
22. The method of claim 20, wherein R_1-R_4 are each -methyl; and R_5-R_{12} are each -H.

23. The method of claim 20, wherein R_1 and R_4-R_{12} are each -H; and R_2 and R_3 are each -phenyl.

24. The method of claim 20, wherein R_1 and R_4 are absent; R_2 and R_3 together form  ; and

R_5-R_{12} are each -H.

25. A method for inhibition of reverse transcriptase of Human Immunodeficiency virus-1 comprising administering to a patient in need thereof a composition comprising an effective amount of a gold(III) complex of formula:



or a pharmaceutically acceptable salt thereof, wherein:

R_1, R_4, R_7 and R_{10} are each independently -H, -halo, -(C_1-C_6)alkyl or -O(C_1-C_6)alkyl, -(6-membered)aryl or -(5 to 10-membered)heteroaryl, each of which may be substituted with one or more -halo, -(C_1-C_6)alkyl, -O(C_1-C_6)alkyl, -OSO_2 or -NO_2;

R_2, R_3, R_5, R_6, R_8, R_9, R_{11} and R_{12} are each independently -H, -(C_1-C_6)alkyl which may be substituted with one or more -C(O)OR_{13}, -halo or =O groups;

R_{13} is -(C_1-C_6)alkyl;

each X^p is independently a pharmaceutically acceptable counter-ion;

m is an integer ranging from -3 to 5;

p is an integer ranging from -3 to 3;

n is equal to the absolute value of m/p; and

a pharmaceutically acceptable carrier.

26. The method of claim 25, wherein R_2, R_3, R_5, R_6, R_8, R_9, R_{11} and R_{12} are each -H.; X^p is Cl^-; m is 1; and n is 1.

27. The method of claim 26, wherein R_1, R_4, R_7 and R_{10} are each -phenyl.

28. The method of claim 26, wherein R_1, R_4, R_7 and R_{10} are each -4-methylphenyl.

29. The method of claim 26, wherein R_1, R_4, R_7 and R_{10} are each -4-methoxyphenyl.

30. The method of claim 26, wherein R_1, R_4, R_7 and R_{10} are each -4-bromophenyl.

31. The method of claim 26, wherein R_1, R_4, R_7 and R_{10} are each -4-chlorophenyl.

32. The method of claim 26, wherein R_1, R_4, R_7 and R_{10} are each -3,4,5-trimethoxyphenyl.

33. The method of claim 26, wherein R_1, R_4, R_7 and R_{10} are each -3,4,5-trifluorophenyl.

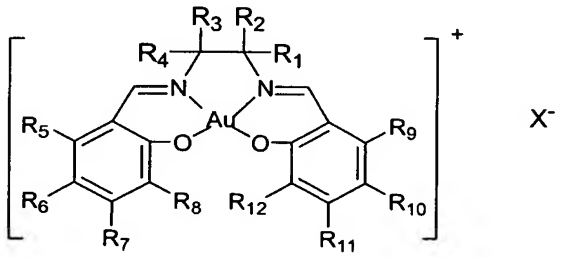
34. The method of claim 25, wherein R_1, R_4, R_7 and R_{10} are each -H; R_2, R_3, R_5, R_6, R_8, R_9, R_{11} and R_{12} are each -ethyl; X^p is Cl^-; m is 1; and n is 1.

35. The method of claim 25, wherein R_1, R_4, R_7 and R_{10} are each -H; and R_2 and R_{11} are each -ethyl; R_3, R_5, R_9 and R_{12} are each -methyl; R_6 and R_8 are each -methyl-3-propanoate; X^p is Cl^-; m is 1; and n is 1.

36. The method of claim 25, wherein R_1, R_4, R_7 and R_{10} are each -4-(N-methyl)pyridinium; R_2, R_3, R_5, R_6, R_8, R_9, R_{11} and R_{12} are each -H; X^p is Cl^-; m is 5; and n is 5.

37. The method of claim 25, wherein R_1, R_4, R_7 and R_{10} are each -4-sulfanatophenyl; R_2, R_3, R_5, R_6, R_8, R_9, R_{11} and R_{12} are each -H; X^p is Na^+; m is =3; and n is 5.

38. A method for inhibition of reverse transcriptase of Human Immunodeficiency virus-1 comprising administering to a patient in need thereof a composition comprising an effective amount of a gold(III) complex of formula:



or a pharmaceutically acceptable salt thereof, wherein:

R_1- R_{12} are each independently -H, -halo, -(C_1-C_6)alkyl or -O(C_1-C_6)alkyl which may be substituted with one or more -O(C_1-C_6)alkyl or -halo;

X is a counter-anion; and

a pharmaceutically acceptable carrier.

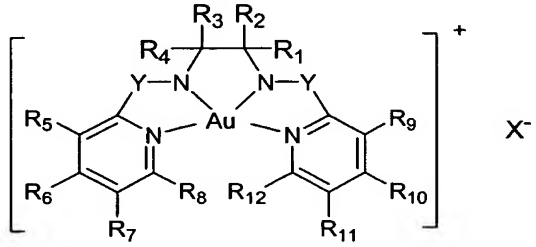
39. The method of claim 38, wherein R_1, R_1', R_2 and R_2' are each -H; and X is Cl^-.

40. The method of claim 39, wherein R_3-R_{10} are each -H.

41. The method of claim 38, wherein R_3, R_5-R_7 and R_9-R_{10} are each -H; and R_4 and R_8 are each -Cl.

42. The method of claim 38, wherein R_3, R_5, R_7 and R_9 are each -H; and R_4, R_6, R_8 and R_{10} are each -Cl.

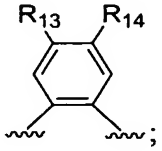
43. A method for inhibition of reverse transcriptase of Human Immunodeficiency virus-1 comprising administering to a patient in need thereof a composition comprising an effective amount of a gold(III) complex of formula:

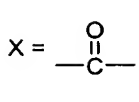


or a pharmaceutically acceptable salt thereof, wherein:

(a) R_1- R_{12} are each independently -H, -halo, -(C_1-C_6)alkyl -O(C_6)alkyl which may be substituted with one or more -O(C_1-C_6)alkyl or -halo; or

(b) R_1 and R_4 are absent; and R_2 and R_3 together form a 6-membered aryl ring of formula



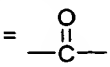
Y is  ;

R_{13} and R_{14} are each -H or -halo;

X is a counter-anion; and

a pharmaceutically acceptable carrier.

44. The method of claim 43, wherein

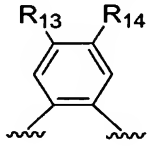
Y is  ; and

X is Cl^-.

45. The method of claim 44, wherein R_1-R_{12} are each -H.

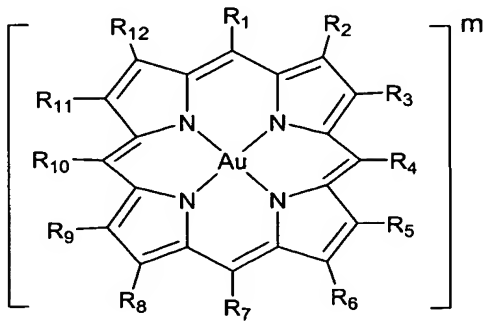
46. The method of claim 44, wherein R_1-R_4 are each -methyl; and R_5-R_{12} are each -H.

47. The method of claim 44, wherein R_1 and R_4-R_{12} are each --H; and $R_2$and R_3 are each -phenyl.

48. The method of claim 44, wherein R_1 and R_4 are absent; R_2 and R_3 together form  ; and

R_5-R_{12} are each -H.

49. A pharmaceutical composition comprising an effective amount of a gold(III) complex of formula:



or a pharmaceutically acceptable salt thereof, wherein:

R_1, R_4, R_7 and R_{10} are each independently -H, -halo, -(C_1-C_6)alkyl or -O(C_1-C_6)alkyl, -(6-membered)aryl or -(5 to 10-membered)heteroaryl, each of which may be substituted with one or more -halo, -(C_1-C_6)alkyl, -O(C_1-C_6)alkyl, -OSO_2 or -NO_2;

R_2, R_3, R_5, R_6, R_8, R_9, R_{11} and R_{12} are each independently -H, -(C_1-C_6)alkyl which may be substituted with one or more -C(O)OR_{13}, -halo or =O groups;

R_{13} is -(C_1-C_6)alkyl;

each X^p is independently a pharmaceutically acceptable counter-ion;

m is an integer ranging from -3 to 5;

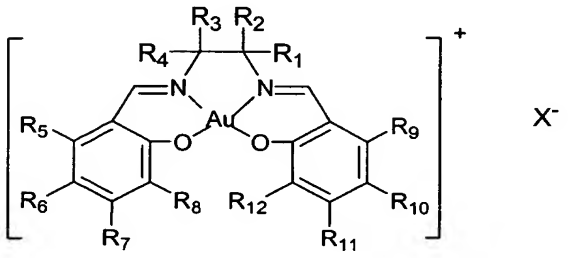
p is an integer ranging from -3 to 3;

n is equal to the absolute value of m/p; and

a pharmaceutically acceptable carrier.

50. The composition of claim 49 further comprising 3'-azido-2',3'-dideoxythymidine.

51. A pharmaceutical composition comprising an effective amount of a gold(III) complex of formula:



or a pharmaceutically acceptable salt thereof, wherein:

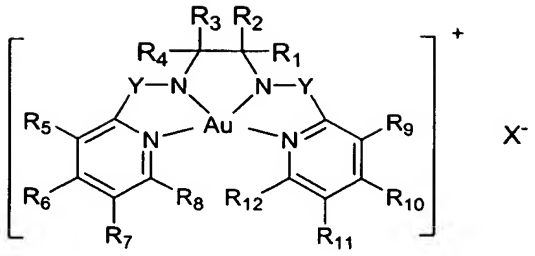
R_1- R_{12} are each independently -H, -halo, -(C_1-C_6)alkyl or -O(C_1-C_6)alkyl which may be substituted with one or more -O(C_1-C_6)alkyl or -halo;

X is a counter-anion; and

a pharmaceutically acceptable carrier.

52. The composition of claim 51 further comprising 3'-azido-2',3'-dideoxythymidine.

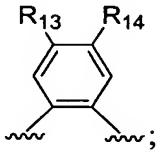
53. A pharmaceutical composition comprising an effective amount of a gold(III) complex of formula:

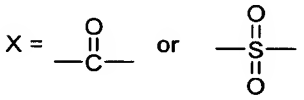


or a pharmaceutically acceptable salt thereof, wherein:

(a) R_1- R_{12} are each independently -H, -halo, -(C_1-C_6)alkyl -O(C_6)alkyl which may be substituted with one or more -O(C_1-C_6)alkyl or -halo; or

(b) R_1 and R_4 are absent; and R_2 and R_3 together form a 6-membered aryl ring of formula



Y is  ;

R_{13} and R_{14} are each -H or -halo;

X is a counter-anion; and

a pharmaceutically acceptable carrier.

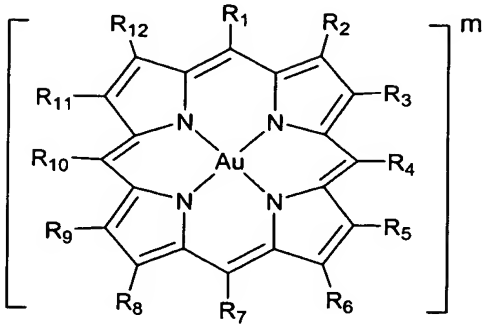
54. The composition of claim 53 further comprising 3'-azido-2',3'-dideoxythymidine.

55. A method for inhibition of reverse transcriptase of Human Immunodeficiency virus-1 comprising administering to a patient in need thereof a composition comprising an effective amount of a gold(III) complex of claim 50.

56. A method for inhibition of reverse transcriptase of Human Immunodeficiency virus-1 comprising administering to a patient in need thereof a composition comprising an effective amount of a gold(III) complex of claim 52.

57. A method for inhibition of reverse transcriptase of Human Immunodeficiency virus-1 comprising administering to a patient in need thereof a composition comprising an effective amount of a gold(III) complex of claim 54.

58. A complex formed between a ligand and a gold(III) complex of formula:



or a pharmaceutically acceptable salt thereof, wherein:

R_1, R_4, R_7 and R_{10} are each independently -H, -halo, -(C_1-C_6)alkyl or -O(C_1-C_6)alkyl, -(6-membered)aryl or -(5 to 10-membered)heteroaryl, each of which may be substituted with one or more -halo, -(C_1-C_6)alkyl, -O(C_1-C_6)alkyl, -OSO_2 or -NO_2;

R_2, R_3, R_5, R_6, R_8, R_9, R_{11} and R_{12} are each independently -H, -(C_1-C_6)alkyl which may be substituted with one or more -C(O)OR_{13}, -halo or =O groups;

R_{13} is -(C_1-C_6)alkyl;

each X^p is independently a pharmaceutically acceptable counter-ion;

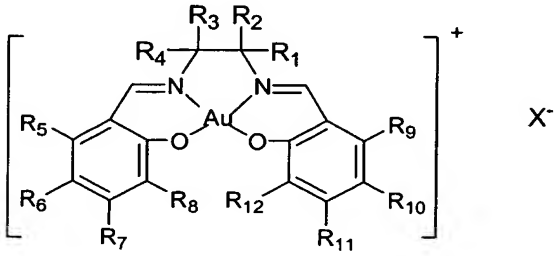
m is an integer ranging from -3 to 5;

p is an integer ranging from -3 to 3; and

n is equal to the absolute value of m/p.

59. The complex of claim 58, wherein the ligand is selected from the group consisting of porphyrins, metalloporphyrins, amino acids, peptides, polypeptides, proteins, nucleotides, polynucleotides, deoxyribonucleic acid, and ribonucleic acid.

60. A complex formed between a ligand and a gold(III) complex of formula:



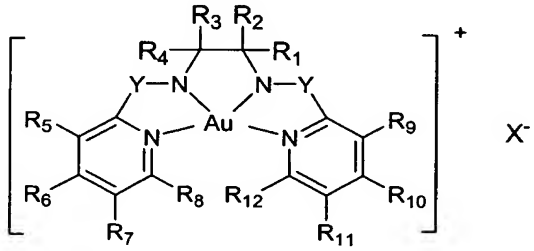
or a pharmaceutically acceptable salt thereof, wherein:

R_1- R_{12} are each independently -H, -halo, -(C_1-C_6)alkyl or -O(C_1-C_6)alkyl which may be substituted with one or more -O(C_1-C_6)alkyl or -halo; and

X is a counter-anion.

61. The complex of claim 60, wherein the ligand is selected from the group consisting of porphyrins, metalloporphyrins, amino acids, peptides, polypeptides, proteins, nucleotides, polynucleotides, deoxyribonucleic acid, and ribonucleic acid.

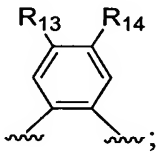
62. A complex formed between a ligand and a gold(III) complex of formula:

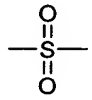


or a pharmaceutically acceptable salt thereof, wherein:

(a) R_1- R_{12} are each independently -H, -halo, -(C_1-C_6)alkyl -O(C_6)alkyl which may be substituted with one or more -O(C_1-C_6)alkyl or -halo; or

(b) R_1 and R_4 are absent; and R_2 and R_3 together form a 6-membered aryl ring of formula



Y is X =  or  ;

R_{13} and R_{14} are each -H or -halo; and

X is a counter-anion.

63. The complex of claim 62, wherein the ligand is selected from the group consisting of porphyrins, metalloporphyrins, amino acids, peptides, polypeptides, proteins, nucleotides, polynucleotides, deoxyribonucleic acid, and ribonucleic acid.